Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION IV
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials
School of Electrical Engineering and Computer Science of Applied Studies

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 21-23. September 2015

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CIP

OR1

The effect of Hot Isostatic Pressing on the MT sample densities

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Mechanically activated powders (0, 10, 40, 80 and 160 minutes) were formed by isostatic pressure 300 MPa to cylindrical green bodies (ϕ 12 mm). First set of samples was sintered at 1300 ^{o}C for 30 min in air (heating rate 10 ^{o}C/min, cooling rate 5 ^{o}C/min). These samples were re-sintered at 1200 ^{o}C for 20 h in air (heating rate 20 ^{o}C/min, cooling rate 10 ^{o}C/min). Samples reached almost 90 % TD.

The second set of samples was sintered at 1400 ^{o}C for 30 in air (heating rate 10 ^{o}C/min, cooling rate 5 ^{o}C/min). Relative densities increased up to 93 % TD. The samples of absence of open porosity (MTO-10, 40, 80 and 160) were post-sintered by pressure assisted technique Hot Isostatic Pressing (HIP) at 1200 ^{o}C for 2 h in argon atmosphere with pressure 200 MPa. The samples increased densities up to 96 % TD for sample MT-160. Electrical measurements were performed in the microwave field of frequency.

OR2

Nb/Mn Codoped $BaTiO_3$ Ceramics - Microstructure and Dielectric Properties

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The influence of additive content on microstructure and dielectric properties of Nb/Mn codoped $BaTiO_3$ ceramics was investigated. The content of Nb_2O_5 was ranging from 0.1 to 5.0 at% Nb. The content of MnO_2 kept constant at 0.05 at% Mn in all investigated samples. Codoped $BaTiO_3$ were obtained by a conventional solid state reaction and sintered in air at 1290^0C and 1320^0C for two hours. The homogeneous and completely fine-grained microstructure with average grain size from 0.3 to 1μm was observed in samples doped with 0.1 at% Nb. In high doped samples, apart from the fine grained matrix, the appearance of local area with secondary abnormal grains was observed. The dielectric permittivity and dissipation factor were investigated as a function of frequency and temperature. Dielectric permittivity of codoped $BaTiO_3$ was in the range of 3900 to 5800 and decreases with increase of additive content. The highest value of dielectric constant at room temperature (ε_r= 5800) and the greatest change at Curie temperature (ε_r= 7500) were measured in 0.1at% Nb doped samples. Dissipation factor was range from 0.07 to 0.62 for all investigated samples. The Curie constant (C) and Curie-Weiss temperature (T_0) together with critical exponent of nonlinearity (γ) were calculated using a Curie-Weiss and modified Curie-Weiss law. The